



ADMIE TECHNICAL DESCRIPTION

HIGH VOLTAGE GLASS INSULATORS COATED WITH RTV SILICONE

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This specification describes the required aspects and technical requirements of a silicone coating at the surface of glass insulators.

1. Deposits

The covering of glass insulators with an RTV silicone coating can be made by spraying or by dipping. The ball of the pin and the socket of the cap must be protected from silicone regardless of the coating method. Coating on the coupling is not allowed. The base of the cap must be covered by a slight layer of silicone coating up to about 2 cm above the disk (approx. point D).

2. Visual

The silicone coating should be homogenous, with a smooth surface and uniform color. No drops, flow marks, grooves, or accumulation of silicone should appear on the surface. For the coating to be acceptable, the silicone layer must be uniform across the surface of the insulator without any bubbles.

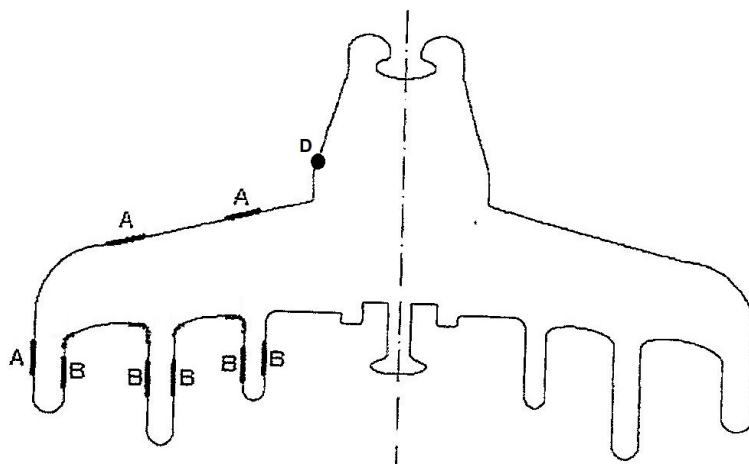
3. Thickness

Thickness measurements must be taken at different positions of the surface to check the average values of the silicone layer. The following drawing indicates the areas where these measurements must be performed.

On the upper surface of the insulator (point A) and the underside of the insulator (point B), three samples will be cut with a flat blade at 120°. The thickness measurement will be performed with the magnetic method, i.e. interposing the sliced coating between a metallic support and the apparatus.

The acceptable limits are:

- Point A : >350 μm
- Point B : >280 μm



4. Adherence

Adherence testing will be performed as described in EN-ISO 2409 and using the tooling required by the standard. Both orthogonal and parallel traces will be made. The measurements should be performed on opposite directions of the upper surface of the same insulator. The acceptable application of silicone should be adherent and uniform, with no traces of bubbles and no uncoated sections.

5. Tests

5.1 Sample tests

Measurement of Coating Thickness according To EN ISO 2808 (any method of the standard applicable for the type of coating and substrate), sampling E1 according to IEC 60383-1.

Measurement of Adhesion according to ISO 2409. Sampling E1 according to IEC 60383-1, acceptance classification up to 1.

High-pressure Water Withstand test according to IEEE 957, sampling E1 according to IEC 60383-1. The test will be performed on five suitably configured test specimen(s) from a distance of one meter. There must be no surface damage to the insulator.

Impulse Puncture Testing in Air according to IEC 61211. The test will be performed on both non-coated and RTV coated glass insulators. Acceptance criteria must be achieved on the tests performed on non-coated insulators only.

5.2 Type tests

Tracking and Erosion test (1000h salt fog test testing) according to IEC 62217. The tests will be performed on two pairs of coated insulators, one in vertical and one in horizontal position.

Alternatively, a 2000h multi-stress ageing test can be performed including rain, fog, UV radiation and voltage application intervals. If such a test is applied then resistance to Weathering/UV according to ISO 4892-2 or ISO 4892-3-3 / IEC 62217 testing can be omitted.

Resistance to Tracking and Erosion of Silicone Coating Material according to IEC 60587 and method proposed in CIGRE Brochure Nr. 478. The tests will be performed on five samples of specially prepared coating material. The minimum acceptance criterion is 1A 3,5kV 6h/60mA.

Water diffusion test (100h- boiling test) acc. to IEC 62039 §3.4

Evaluation of Degree of Hydrophobicity according to IEC/TS 62073 – Determination of the contact angle (wetting angle $\geq 105^\circ$, static contact angle).

Retention of Hydrophobicity as per CIGRE Brochure 478 and as described in CIGRE Brochure 255 and 442. The test is carried out on four samples placed on an inclined plane of 60° and subjected to two metal electrodes. The test voltage between electrodes will be 6 kV.

Hydrophobicity Transfer Ability as per CIGRE Brochure 478 and as described in CIGRE Brochure 442. The test will be carried out on four silicone samples, 25 cm × 10 cm each, with a thickness of 350 ± 50 μm. The thickness of the artificial pollution layer shall be 200 μm ± 15 %.

Resistance Test to High Voltage, Low Current Arc Discharges, according to IEC 61621 or ASTM D495, performed on four samples of glass insulators.

Verification of Adhesion to Water, as per IEEE 1523-2002 (100h boiling water test). The test will be performed on four suitably coated test specimens.

Measurement of Relative Permittivity and Dissipation Factor according to IEC 62631-2-1. The test frequency will be at 100 Hz and 20 kHz. The test will be performed on four suitably configured test specimens. The acceptable values for ϵ are $4 \geq \epsilon \geq 3$ and $\tan \delta \sim 10^{-4}$

Breakdown Field Strength Measurement according to IEC 60455-2 or IEC 60243-1, performed on four samples of glass insulators.

Tear Strength of Coating Material according to ISO 34-1 ($\geq 3.5\text{N/mm}$). The test will follow the ISO 34-1 method (trouser test piece) and will be performed on five samples per direction, as per clauses 6.3 and 7. Alternatively ASTM D624 test standard/method can be applied

Resistance to Weathering/UV according to ISO 4892-2 or ISO 4892-3-3 / IEC 62217. The test will be performed on three samples, each exposed to 1000h of UV light. After the test, the samples will be evaluated through visual examination and determination of surface roughness as per ISO 4287.

Measurement of Volume resistivity according to IEC 62631 performed on three specially prepared samples of coating material (acceptance limits 1010- 1012 Ohm/cm).